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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/380,336 11/23/99 HOFSTRAAT

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EXAMINER

GABEL, G

ART UNIT

PAPER NUMBER

1641

DATE MAILED:

08/14/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/380,336

Applicant(s)

HOFSTRAAT, JOHANNES WILLEN

Examiner

Gailene R. Gabel

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1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Amendment Entry***

1. Applicant's amendment filed 5/25/01 in Paper No. 11 is acknowledged and has been entered. Claims 1-6 and 8-9 have been amended. Claims 10-14 have been added. Claims 1-14 are pending and under examination.

**Rejections Withdrawn**

***Claim Rejections - 35 USC § 102***

2. In light of Applicant's amendment and argument, the rejection of claims 1-4 and 7 under 35 U.S.C. 102(e) as being inherently anticipated by Wieder et al. (US 5,830,769), is hereby, withdrawn.

**Rejections Maintained**

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-4, 6, 8-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, line 11, change "luminance" to "luminence".

Claim 1 is incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps correlation or detection step. Specifically, the preamble recites "a method for detection of analyte in a sample" but there is no detection step to correlate the measured "luminence from the mixture" and the presence or amount of analyte.

Claim 4, line 4 is indefinite in reciting "complexing ability" because it fails to recite a positive limitation in the claim.

Claim 6 is indefinite in reciting "capable of" because it fails to recite a positive limitation in the claim.

Claim 9 is indefinite in reciting "capable of" because it fails to recite a positive limitation in the claim.

Claim 10 is vague and indefinite in reciting "in contact" because it is unclear and fails to specifically define what is encompassed by the term "contact", i.e. conjugated, bound, near proximity, etc.

In claim 10, line 11, change "luminance" to "luminence".

Claim 10 is incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps correlation or detection step. Specifically, the preamble recites "a method for detection of analyte in a sample" but there is no detection step to correlate the measured "luminence from the mixture" and the presence or amount of analyte.

Claim 12, line 3 is vague and indefinite in reciting "in contact" because it is unclear and fails to specifically define what is encompassed by the term "contact", i.e. conjugated, bound, near proximity, etc.

Claim 13 is vague and indefinite in reciting "specific binding partner and the immunoreactant are attached to a carrier" because it is unclear and fails to specifically define what is encompassed by the term "attached", i.e. immobilized, covalently bound, etc. Further, claim 13 as being drawn to a kit is unclear as to whether the "specific binding partner" and the "immunoreactant" are each "attached" to the same carrier or each attached to a (separate) carrier.

Claim 14 is vague and indefinite in reciting "specific binding partner and the immunoreactant are attached to a carrier" because it is unclear and fails to specifically define what is encompassed by the term "attached", i.e. immobilized, covalently bound, etc. Further, claim 13 as being drawn to a kit is unclear as to whether the "specific binding partner" and the "immunoreactant" are each "attached" to the same carrier or each attached to a (separate) carrier.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1-9 and new claims 10-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Kardos et al (US 6,159,686) for reason of record in Paper No. 7.

In addition, Kardos et al. disclose that specific binding partners of the analyte or immunoreactants to the analyte and labels maybe incorporated into a carrier particle (microspheres, microparticles, immunobeads, superparamagnetic beads, magnetic beads).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5-6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wieder et al. (US 5,830,769) in view of Kardos et al (US 6,159,686) for reason of record.

6. Claims 1-4, 7, as amended, and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wieder et al. (US 5,830,769) in view of Kardos et al (US 6,159,686)

Wieder et al. disclose a homogeneous assay method for detecting an analyte in a test sample wherein the sample is contacted with a lanthanide ion-ligand complex

coupled with an immunoreactant and comingled with a specific binding partner and wherein interligand energy transfer takes place in the binding reaction (see columns 3-4 and 8). Wieder et al. specifically teach a lanthanide ion (rare earth metal) complexed with a ligand wherein the ligand is a member of a specific binding capable of forming a changed fluorescence chelate with the lanthanide ion (see column 4, lines 5-23). The lanthanide ion includes neodymium ( $\text{Nd}_{3+}$ ) and erbium ( $\text{Er}_{3+}$ ) (see column 5, lines 13-17). The ligands useful as chelate includes polyaminocarboxylic acid, pyridinedicarboxylic acid, and derivatives thereof (see column 5, line 18 to column 6, line 64). The chelate forming ligand is the site for linking to specific binding partners (biospecific groups) that specifically recognize or immunologically react with another molecular species such as antibodies and antigens, hormones and receptors etc. (see column 7, lines 51-65). Wieder et al. further disclose including a sensitizing moiety to enhance or quench the fluorescence of the chelate which includes rhodamines, fluoresceins, and phycobiliproteins (see column 9, lines 9-60).

Wieder et al. differ in failing to disclose specific ranges of light wavelengths of excitation as required by the claimed invention for measuring luminence from the assay mixture.

Kardos et al. disclose methods and apparatus for performing sensitive detection of analytes by contacting the sample with an immunoreactant provided with a label linked to an upconverting phosphor and a specific binding partner for the analyte. Upconverting labels comprise a lanthanide ion, i.e. erbium and neodymium, complexed with a ligand and convert long wavelength excitation radiation, i.e. near infrared, to

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emitted radiation. The ligand compounds comprise a sensitizing moiety for use as upconverting phosphors including polyaminocarboxylic acids such as ethylenediaminetetraacetic acid (EDTA) and diethylenetriaminepentaacetic acid (DTPA) and also include upconverting organic dyes such as cyanine, phthalocyanine, rhodamine, acridine, oxazine, and derivatives thereof which absorb in the 400-1000 nm region. The apparatus uses an excitation light source including near infrared (pump) laser and a suitable detector such as a photodiode. Kardos et al. disclose packaging the compositions comprising upconverting labels and reagents for use in the assay in a kit formation. In addition, Kardos et al. disclose that specific binding partners of the analyte or immunoreactants to the analyte and labels maybe incorporated into a carrier particle (microspheres, microparticles, immunobeads, superparamagnetic beads, magnetic beads).

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to irradiate the assay mixture in the method of Wieder using the detection system and radiation requirements taught by Kardos because Wieder teaches the same elements and organic dyes/sensitizing moieties which inherently absorb in the 400-1000 nm range such as those taught by Kardos and Wieder is generic in the type of detection/irradiation method used and therefore an apparatus with the same excitation light source and suitable photodiode detector thereto such as taught by Kardos is suitable for performing the same in the method of Wieder. One of ordinary skill in the art at the time of the instant invention would have been motivated to incorporate the detection system and requirements as taught by Kardos into the method



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of Wieder because Kardos specifically disclosed in column 6, lines 25-39 that his detection system enables ultrasensitive detection of upconverting lanthanide phosphors and upconverting organic dyes by eliminating background noise which is a characteristic advantage in use of up-converting labels.

### ***Response to Arguments***

6. Applicant's arguments filed 5/25/01 have been fully considered but they are not persuasive.

a) Applicant argues that Kardos discloses a two photon process wherein two photons are required to provide the energy to excite his complexes which differs from the instant invention which discloses a one-photon process. Specifically, Applicant contends that Kardos does not disclose or suggest a one-photon process using light with a wavelength in the range of 400-1000 nm region

Contrary to Applicant's argument, Kardos anticipates the claimed invention as currently recited by disclosing all the elements required by the instant invention, such as the lanthanide ion with a complexed ligand comprising or including a sensitizing moiety, i.e. polyaminocarboxylic acids such as EDTA and DTPA with upconverting organic dyes such as cyanine, phthalocyanine, rhodamine, acridine, oxazine which characteristically and inherently absorb in the 400-1000 nm region. Further, in column 28, lines 45-52 applications, Kardos disclose irradiation necessitating only one light source for irradiation at 1000 nm. In column 31, Kardos discloses illumination/irradiation at an excitation wavelength and detection of complexes at one or more emission

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wavelengths. Further, the claimed invention as currently recited does not exclude the two photon process disclosed by Kardos. Therefore, it is maintained that Kardos anticipates the teaching of the instant invention.

b) Applicant argues that Kardos and Wieder fail to disclose and suggest a sensitizing moiety which absorbs in the 400-1000 nm region.

Contrary to Applicant's argument, each of Kardos and Wieder anticipates or suggests the claimed invention as currently recited by disclosing all the elements required by the instant invention, such as the lanthanide ion with a complexed ligand and including a sensitizing moiety in the form of polyaminocarboxylic acids such as EDTA and DTPA and dyes such as cyanine, phthalocyanine, rhodamine, which then would characteristically and inherently absorb in the 400-1000 nm region. Further, the claimed invention as currently recited does not exclude the two photon process disclosed by Kardos. Therefore, it is maintained that the claimed invention is obvious over the combination of Wieder and Kardos.

7. No claims are allowed.

**Remarks**

8. Prior art made of record are not relied upon but considered pertinent to the applicants' disclosure:

Mironov et al. (SU85 959054 850620) disclose Ytterbium porphyrin complex preparations.

Mironov et al. (SU88 441045 880429) disclose ytterbium complexes with porphyrin compounds as luminescence probes.

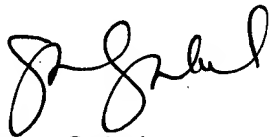
9. Applicant's amendment necessitated the new ground of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

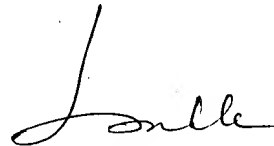
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gailene R. Gabel whose telephone number is (703) 305-0807. The examiner can normally be reached on Monday to Thursday, 6:30 AM - 4:00 PM and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (703) 308-3399. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-4242 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.



Gailene R. Gabel  
Patent Examiner  
August 3, 2001



LONG V. LE  
SUPERVISORY PATENT EXAMINER  
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08/13/01